BLM LIBRARY
88081449

Jessitte Dejot

POWDER RIVER

TRACT PROFILE

ASHLAND (DECKER-BIRNEY) TRACT, MONTANA

REVISED

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

1991 DEC 11 AM 8 00

RECEIVED
MONTANA STATE OFFICE
BILLINGS, MONTANA

#54791579 ID: 88081449 HD 242.3 .P6934a

SITE SPECIFIC ANALYSIS
3. ASHLAND (DECKER-BIRNEY)

INTRODUCTION

A. PURPOSE AND NEED

The purpose of this analysis is to comply with the Secretary of Interior's decision that a sufficient number of tracts be delineated and selected for sale from the areas designated in land use plans as acceptable for further consideration for leasing to meet the regional leasing target. As a result of the 1979 Powder River Management Framework Plan (MFP) Update, federal coal in this tract was identified for further consideration for development through competitive leasing.

BLM Library
Denver Federal Center
Bldg. 85, OC-521
P.O. Box 25047
Denver, CO 80225

I. ALTERNATIVES, INCLUDING THE PROPOSED ACTION

A. NO ACTION ALTERNATIVE

Under the no action alternative, federal coal would not be leased. Because of the "checkerboard" ownership patterns, development would not occur on this tract. Approxiamtely 378 million tons of coal, recoverable by existing methods, would not be mined. It should be noted that mining of fee coal will take place in the nearby area with attendant growth and development to occur.

B. PROPOSED ACTION

The proposed action is to offer for competitive leasing a 5,528-acre tract of land in western Powder River County and 378 million tons of recoverable coal. The tract comprises an area identified by the U.S. Geological Survey as an economical mining unit for development of a 40-year strip mining operation. The tract is located approximately five miles southeast of Ashland and one mile south of U.S. Highway 212. See Map 1 for location and legal description.

The mining operation would have an annual production of 9.1 million tons and would employ 409 persons during construction and 370 persons during production. The tract is composed of 119 million tons of federal coal, 203 million tons of fee (private) coal and 56 million tons of state coal. Surface disturbance would be approximately 138 acres a year. Total disturbed area would be 5,528 acres from mining and 210 acres from facilities and haul roads.

For more specific information on the proposed mining operation, refer to the Engineering Report prepared by the U.S. Geological Survey.

The proposed action assumes that proper mining and reclamation will be carried out according to existing state and federal regulations. These include: Office of Surface Mining Reclamation and Enforcement (OSM) regulations (30 CFR 700-899), Environmental Protection Agency (EPA) regulations (40 CFR 0-1399), Department of the Interior's coal management program regualtions (43 CFR 23 and 3400 and 30 CFR 211), and regulations of the Montana Department of State Lands.

Tract Delineation Report Summary

Tract Name: Ashland (Decker-Birney) State: Montana

The Ashland (Decker-Birney) tract is located in the center of the northern Powder River Basin, Big Horn County, Montana. The tract contains one recoverable coal bed, the Knobloch, which is present in one seam.

The coal deposit occurs in the top part of the Fort Union Formation (Paleocene), which comprises approximately 3,000 feet of sandstones, shales, siltstones, and coal seams. The formation occurs in nearly flat-lying beds. The coal is subbituminous in rank and weighs 1,770 tons per acre-foot. There are no known geologic hazards to surface mining in the Ashland tract. See the tract profile summary for the salient geologic data for the tract.

The generic mining plan calls for a surface mine using draglines, electric shovels, dump trucks, loaders, scrapers, and other support equipment. The coal would thus be mined to a depth of 200 feet or until the limiting stripping ratio (6:1) has been reached. The plan indicates that the coal would be shipped by railroad to an electrical utility out of the Powder River Region.

Tract Profile Summary

Ashland (Decker-Birney)

Coal Data	Proposed Action
Total Reserves (Million Tons Strippable)	420
Recoverable Reserves (Million Tons)	federal 119 (total 378)
Average Coal Thickness (Ft.)	62
Average Overburden (Ft.)	150
Coal Rank	subbituminous
Percent Recovery	90
Proximate Coal Analysis	
Percent Moisture	29.3
Percent Ash	5.4
Percent Sulfur	0.2
BTUs Per Pound	8,354
Mine Life (Years)	40
Annual Production Rate (Million Tons)	9.1
Tract Area (Acres)	5,528
Surface Mine/Truck Shovel Operation	
Employment	
Construction	412
Mine Operation	335
Environmental Data	
Water Requirements	127 acre-feet/year.
Transportation, Land Use, VRM, Vegetation	Moderate during mining; low after mining.
Soils	High to moderate.
Reclamation	Low, if successful.
Wildlife	Moderate loss of habitat.
Noise, Air Quality	High during mining, low after successful reclamation.
Agriculture	Moderate during mining; low after successful reclamation.

TRACT PROFILE INTRODUCTION

Background

In July 1979, the BLM, Miles City District Office completed the Powder River Resource Area update for portions of Powder River, Custer, Big Horn, Treasure and Rosebud counties. The land use planning process included applying unsuitability criteria, multiple-use conflict evaluation, and surface owner consultations. As a result of that work, areas were identified that could be further considered for coal development. The areas are available for consideration for new competitive leasing, leasing by exchanging and modifying existing leases.

Following land-use planning the BLM requested expression of interest which, along with other information, guided the GS in delineating this tract. Results of that work are summarized in this profile.

Personnel from BLM, Miles City District inventoried the tract to determine the site specific resource values and then analyzed potential environmental effects of coal development on this individual tract. Among other items, the unsuitability criteria (43 CFR 3461) were reconsidered on this site-specific basis. Any new findings of unsuitability are reflected in the delineation and development proposal of the tract described in this profile.

To be further considered for new competitive leasing, the tract will be presented to the Regional Coal Team who guides and reviews tract ranking and selection and sale scheduling procedures that develop alternatives which would be analyzed in a regional environmental impact statement (EIS). The EIS would analyze the site-specific and regional cumulative effects of coal leasing and development. Alternatives addressed in the EIS would include different combinations of tracts that meet a regional coal leasing target. The analysis of those groups of tracts would result in different impacts than the assessment made in this document for this specific tract. During the process this preliminary tract could be modified. Ultimately, the Secretary will select specific tracts for lease sale. If the tract is leased, the lessee would be required to submit a plan for mining and reclamation (M&R) to the Secretary of Interior, Office of Surface Mining (OSM) for review and approval within 3 years after leasing. Once a mining plan has been submitted, OSM would review the proposed developments of the mining plan. OSM would prepare a site-specific environmental assessment or EIS prior to approval of the mine plan.

Development of the tract is in accordance with the federal coal management program adopted by the Secretary, Department of the Interior, in June 1979. Basis of the program was, in part, the Final Environmental Statement for the Federal Coal Management Program. Implementation procedures are contained in Title 43 - Code of Federal Regulations - Part 3400 (43 CFR 3400). Authorizing actions are The Mineral Leasing Act of 1920, as amended; The Mineral Leasing Act for Acquired Lands of 1947, as amended; the Federal Land Policy and Management Act of 1976; the Surface Mining Control and Reclamation Act of 1977; the Multiple Mineral Development Act of 1954; the Department of Energy Organization Act of 1977; the National Environmental Policy Act of 1969; the Federal Coal Leasing Amendments Act of 1976, as amended; the Act of October 30, 1978, and Federal Regulations concerning federal coal leasing and development including 43 CFR 3400; 30 CFR 211; and 30 CFR 700-899.

In adopting the coal program, the Secretary established a tentative competitive coal leasing target of 776 million tons for 1982 in the Powder River Region of Wyoming and Montana. Subsequent sales would then follow on a 2 to 4 year cycle.

Purpose and Need for Action

Purpose of the action is to offer strippable federal coal reserves that can be further considered for coal leasing and development to help meet the energy needs of the nation.

This tract profile contains a summary of the tract delineation report and a site-specific analysis (SSA). The United States Department of the Interior, Geological Survey (GS) delineated the tract while the Bureau of Land Management (BLM) completed the site-specific environmental inventory and preliminary analysis.

Figure 1.2-1

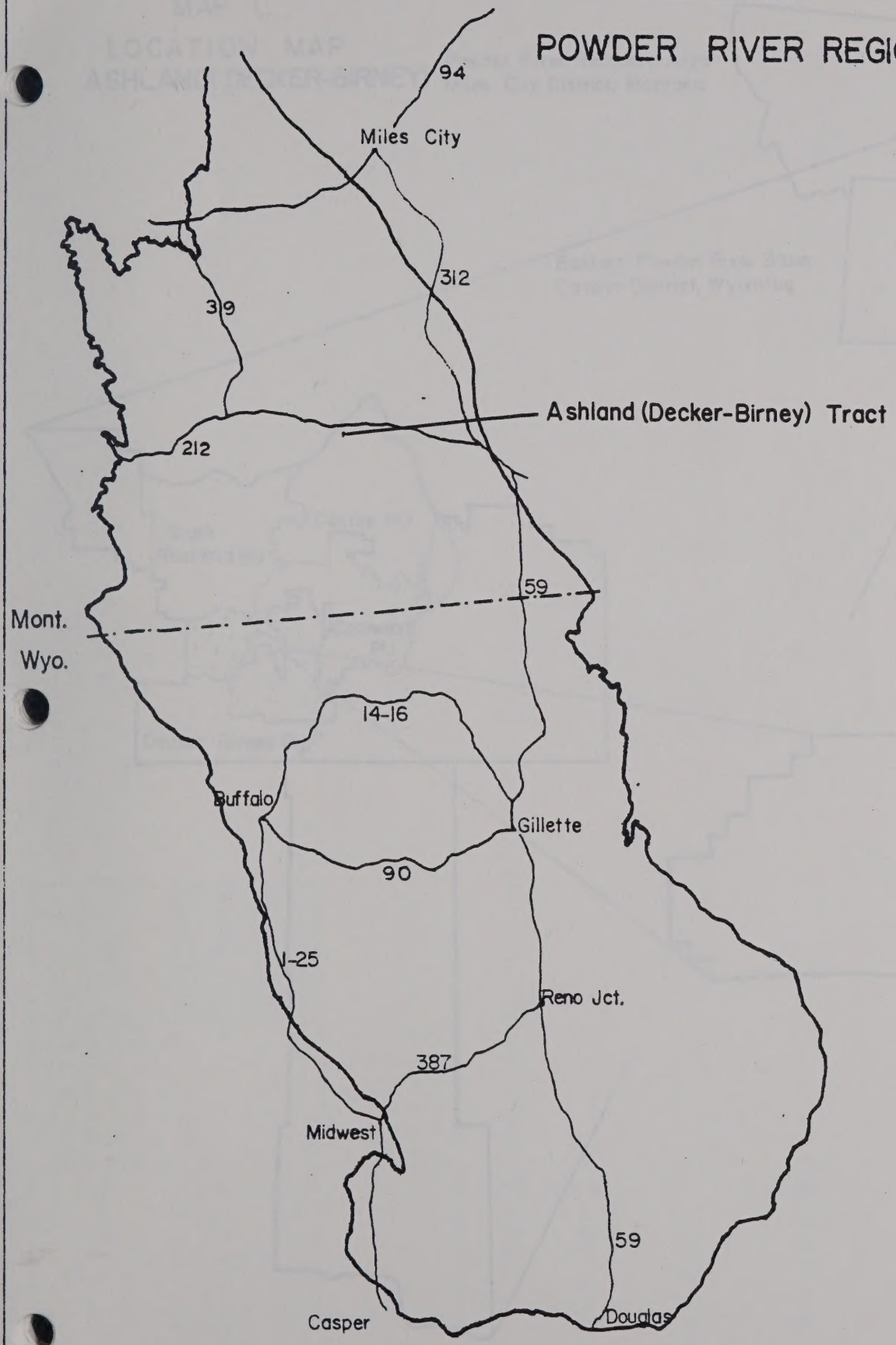
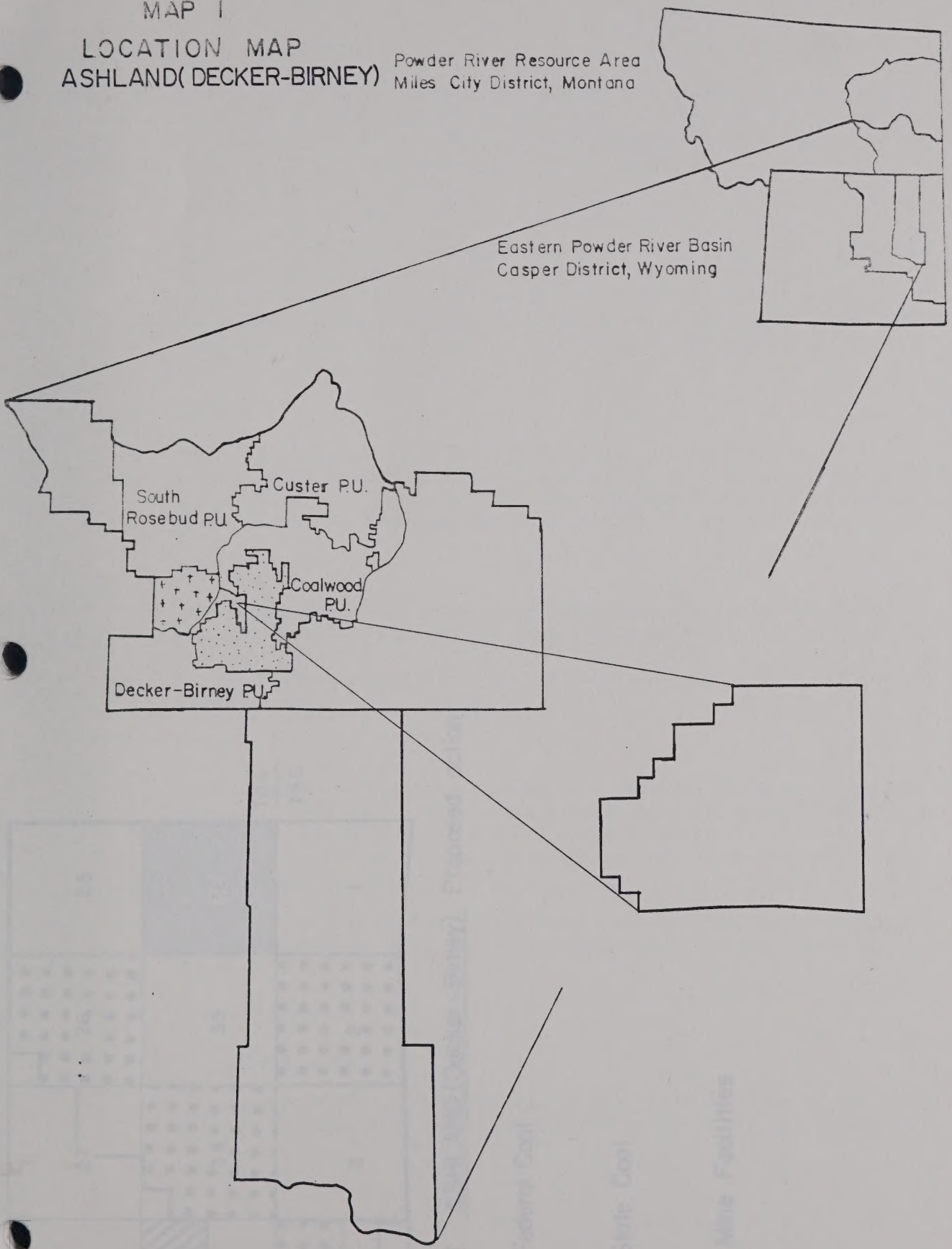


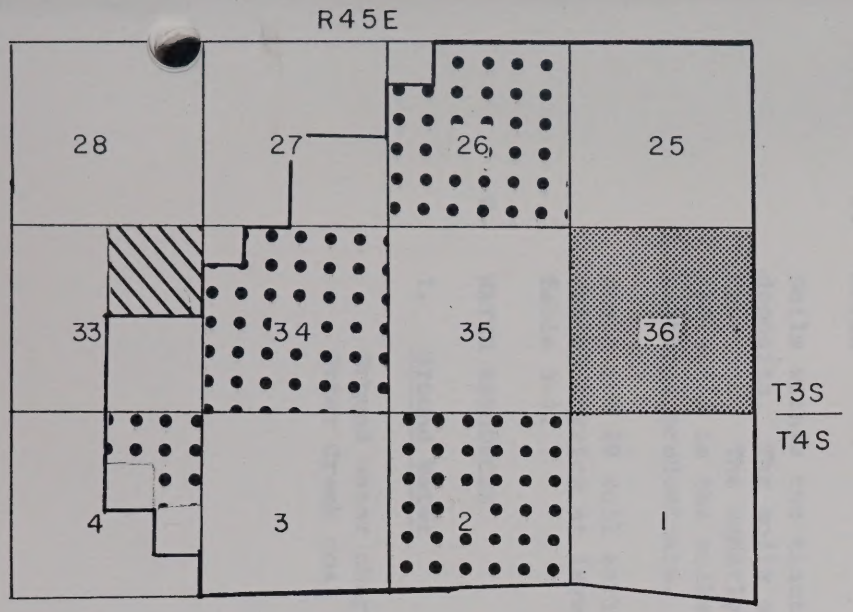
FIGURE 1.2-1

MAP 1

LOCATION MAP
ASHLAND(DECKER-BIRNEY)

Powder River Resource Area
Miles City District, Montana





TRACT ASHLAND (Decker-Birney) Proposed action

Federal Coal

State Coal

Mine Facilities

Mine Locations
Zone Limit
Lease Limit
Eastern Development Zone
Twist

II. AFFECTED ENVIRONMENT

The environment that currently exists and changes anticipated from ongoing trends are included in this section. Information is presented within the time frame of the proposed action including the alternatives, and is restricted to that information required to assess significant impacts.

A. TOPOGRAPHY

The EMU is located on a broad, relatively flat ridge that is bounded on the north, south and east by alluvial valleys. Erosion of the soft sedimentary rock often produces coulees or steep-sided gullies associated with a dendritic drainage pattern. Elevation ranges from 3,020 feet near Otter Creek to 3,380 feet at the highest point on the ridge.

B. GEOLOGY

The area is underlain by sandstone, shale, clinker and coal belonging to the Tongue River Member of the Fort Union Formation (Paleocene). The Knobloch coal seam averages about 60 feet thick, under overburden ranging from 30 feet to 300 feet in thickness.

C. PALEONTOLOGY

Known paleontological resources in the area consist of poorly silicified tree fragments and pieces of unidentified calcareous

shells. Fossils possessing exceptional scientific value are not known to occur in the tract.

D. SOILS

Soils within the tract are formed in sandstone, shale and alluvial deposits. The soils occur along ridges, divides, footslopes and terraces. The underlying bedrock characteristics are closely reflected in the soils since they are not well-developed and loamy textures predominate.

There are 29 soil series in the tract, surveyed by the Soil Conservation Service at level two. The soils discussed are listed in Table 3-1.

E. WATER RESOURCES

1. Ground Water

Ground water characteristics in the tract are typical for the Otter Creek coal area. Four stock wells are in use in the

ASHLAND-DECKER BIRNEY SOIL EROSION
TABLE 3-1

Soil Mapping Unit Name	Depth Shallow 0-20	Depth Moderately Deep 20-36	Depth Deep 36+ 1/	Percent Slope	Soil Erosion Potential 1/ Wind	Soil Erosion Potential 1/ Water	Surface Acres	Percent of Area	Soil Reconst. Potential 2/	Soil Hazard Condition	3/ Suitability of Soil Material for Plant Growth (Acre Feet) Good	Fair	Poor
Arvada-Bone complex			X	0-4	Low	Mod.	44	1	Poor	Excess lime and salts	—	—	220
Cabba association; Elso silt loam; Ringling-Cabba association	X			8-15	Low	Mod.	1644	30	Poor	Excess lime	—	483	526
Cushman-Elso silt loams	X (.30)	X (.70)		4-15	Low	Mod.	147	3	Good	—	163	69	49
Elso silt loam	X			15-45	Low	High	86	1	Poor	Excess lime, slope	—	50	93
Farland and Haverton soils; Haverson silty clay loam, silt loam, soils, channeled; McRae silt loam			X	0-8	Low	Mod.	231	4	Fair	Excess lime	7	1138	10
Fort Collins silt loam			X	2-4	Mod.	Mod.	9	<1	Fair	Excess lime	3	42	—
Haverson soils, saline			X	0-4	Low	Mod.	35	1	Poor	Excess lime and salts	—	—	105
Heldt silty clay loam;			X	0-2	Low	Low	4	<1	Fair	Excess lime, too clayey	—	20	—
Heldt silty clay loam			X	4-8	Low	Low	38	1	Fair	Excess lime, too clayey	—	190	—
Hesper silty clay loam			X	4-8	Low	Mod.	26	<1	Poor	Too clayey	—	13	117
Hopley and Relan loams			X	4-8	Low	Mod.	68	1	Good	—	110	93	85
Kyle clay			X	8-15	Low	Mod.	46	1	Poor	Too clayey	—	—	153
McRae silt loam			X	2-4	Low	Mod.	154	3	Fair	Excess lime	65	705	—
McRae silt loam			X	4-8	Low	Mod.	12	<1	Fair	Excess lime	5	55	—

1/ Soil Depth Classification and Soil Erosion Potential is derived from the Powder River County Soil Survey Report.

2/ Soil Reconstruction Potential is derived from the National Soils Handbook.

3/ Depth (in acrefeet) of available soil calculated from acres x acrefeet/acre = suitability of soil material for plant growth.

Soil Mapping Unit Name	Depth 1/ Shallow 0-20	Moderately Deep 20-36	Deep 36+	Percent Slope	Soil Erosion Potential 1/ Wind	Water	Surface Acres	Percent of Area	Soil Reconst. Potential 2/	Soil Hazard Condition	3/ Suitability of Soil Material for Plant Growth (Acre Feet) Good	Fair	Poor
Midway silty clay loam	X			2-8	Low	Mod.	82	1	Poor	Excess lime, too clayey	—	—	96
Midway-Elso association; Midway and Elso rocky soils	X			8-75	Mod.	High	2710	49	Poor	Excess lime	—	540	3089
Relan gravelly loam, gravelly variant			X	4-8	Low	Mod.	15	<1	Poor	Excess lime	—	25	50
Ringling-Relan association	X (.50)		X (.50)	6-25	Low	Mod.	35	1	Poor	Excess lime	19	38	54
shale outcrop	X			—	Mod.*	High	12	<1	Poor	Erosion, slope	—	—	—
Thurlow silty clay loam			X	4-8	Low	Mod.	28	1	Fair	Excess lime, too clayey	—	298	46
Thurlow silty clay loam			X	8-15	Low	High	102	2	Fair	Excess lime, too clayey	—	71	13
Totals							5528	100			372	3830	4706
* variable wind erosion potential													

Soil Depth
Shallow- 83%
Moderately Deep- 2%
Deep- 15%

Soil Erosion Potential
Wind
Low- 51%
Moderate- 49%
Water
Low- 1%
Moderate- 46%
High- 53%

Soil Reconstruction
Good- 4%
Fair- 11%
Poor- 85%

Suitability of Soil Material for Plant Growth
Good- 1%
Fair- 14%
Poor- 17%
Unsuitable- 68%

tract. The Knobloch coal seam is a main source of water. It is saturated in the tract and is preliminarily estimated to flow at 900 cu ft/day (Cannon 1980) toward Otter Creek. Total dissolved solids (TDS) concentration or salinity averages about 2,500 milligrams per liter (mg/L) for Knobloch coal carried water.

2. Surface Water

Otter Creek is the only major stream in the vicinity of the tract. Stream flow is measured at Ashland, about six miles south (downstream). Mean annual yield is 6.22 acre feet/year or 0.54 cu ft/sec (USGS 1979). Approximately 4,200 acres of the drainage is irrigated, mostly by waterspreading (Knapton and McKinley 1977). Subirrigation is relied upon to supply moisture during the summer. Water quality data is available above and below the site (See Regional paper, unpublished manuscript in Miles City District Office of BLM). Total dissolved solids concentration (TDS) on index to salinity, varies from 228 to 2,690 mg/L and is seldom measured below 2,000 mg/L. Lower concentrations occur during high flows from snowmelt and storms in the winter and early spring. Sediment yield varies from 0-0.2 ac ft/sq mi/yr for bottomlands to 0.8-1.2 for hillslopes (EMRIA 1975).

3. Alluvial Valley Floors and Floodplains

Part of the tract contains a flood plain and possible alluvial valley floor (AVF) over public minerals. There is much overlapping of the floodplain and AVF. The floodplain is unsuitable for mining and final AVF determination will be made by the Office of Surface Mining at mine plan stage.

F. VEGETATION

The Ashland (Decker-Birney) Economical Mining unit (EMU) is made up of one major vegetative rangeland type (Payne 1973). which is the ponderosa pine savannah (See Regional paper). The area included in the vegetative type consists of: (a) sagebrush-grassland - 3965 acres, (b) ponderosa pine - 1370 acres, (c) Other - 463 acres. Within this vegetative type, there are varying range sites with varying production yields (pounds per acre) and condition classifications. There are approximately 1,018 AUMs being produced per year on the tract.

G. LAND RESOURCES

1. Agriculture

Agriculture operations in this area are mainly livestock, hay (alfalfa or grass-legume) and some small grains. The bottom-

lands are flood-irrigated during spring runoff, then sub-irrigated for the balance of the growing season. The water in Otter Creek is too high in salts and alkalinity for irrigation the rest of the growing season. Alfalfa, grass-legume hay or small grains (oats or barley) are crops raised to feed the livestock in the winter months. Approximately 8.38 percent 463 acres) of the tract, which is Class II, III, and IV land, is currently being used as cropland. In addition, there are approximately 362 acres of Class II, III, and IV privately-owned land (6.55 percent of the tract) that are suitable for cropping, but not presently cropped. This acreage could produce approximately 680 tons of alfalfa and support 181 AUMs or produce 6,792 bushels of winter wheat per year.

The State of Montana owns about 16 acres of Class III (0.29 percent of the tract) that is suitable for cropland, but is not being cropped. This land could produce 14 tons of alfalfa and support eight AUMs or produce 288 bushels of winter wheat.

Federal land consists of approximately two acres of Class IV land that is suitable for tame pasture that would provide approximately three AUMs, less than one percent of the tract. The balance of all surface is being utilized as rangeland (see Vegetation section for additional information.

2. Recreation

The tract is relatively isolated from recreational use or demand and there are no recreational developments in the area. Some very limited hunting use may occur, especially since the area is immediately adjacent to Custer national Forest, where opportunities are better. Remoteness from population centers, effectively prohibits use of the area. The area contains no wilderness potential.

3. Other Land Uses

The land within the tract is presently used solely for ranching with some farming of hay and wheat fields in the bottomlands of the creek. There are no industrial activities and the only other use of the tract is for a small portion occupied by the Otter Creek road. Existing roads are gravel and receive low use and maintenance. There is no rail service at present, however, the Tongue River Railroad Company proposes to construct a railroad to run from Birney to Miles City, Montana, where it would connect with Burlington Northern tracks. The new mine would also require a 5-mile spur to be built to the Ashland (Decker-Birney) tract. The route is not final and several alternatives have been proposed. If approved, construction would begin in 1982 with completion scheduled in 1984.

H. WILDLIFE AND FISHERIES

The Ashland (Decker-Birney) tract supports a wide variety of wildlife, with nearby Otter Creek supporting a limited sport fishery for game and non-game fishes. Shrub species important to wildlife such as skunkbrush (Rhus trilobata), currant (Ribes spp.), rose (Rosa spp.) and snowberry (Symphoricarpos spp.) are found scattered throughout the tract with some concentrations in the draws. Home Creek and Threemile Creek both support riparian hardwood plant communities.

Two sharp-tailed grouse arenas occur over private minerals within the tract. One other arena is located immediately adjacent to the tract over federal minerals. A total of 114 acres were excluded by unsuitability to maintain this arena and adjacent nesting coverall adjacent to the EMU. Attendance at these arenas was 30, 5, and 12 males respectively, while average male attendance at all arenas in a 92 square mile area was 17.8 birds. Relative density for the EMU is 0.23 arenas/sq mi. Two additional arenas occur on immediately adjacent Custer National Forest lands. Mule deer use occurs in all of the tract with summer densities of about 1.6 deer/sq mi. Winter use of the area appears to be minimal.

Predominant antelope use of the area is on the dissected midslope areas in the sagebrush-grassland vegetation type. Spring use by up to 24 antelope has been observed on the area, but use during the remainder of the year is minimal.

The lower Otter Creek drainage has been identified as a spawning stream for several species of fish migrating out of the Tongue River. Of greatest concern are the smallmouth bass and northern pike. Although the EMU does not include the stream, it does have a constributing influence to the water quality and quantity.

The bald eagle has been observed as a migrant in the area and the golden eagle is a breeding resident in the lower Otter Creek drainage. Five nests have been identified two to three miles south of the EMU. No other threatened or endangered species occur in the area.

State of Nontana species of special interest or concern identified in or near the EMU are the long-eared owl, prairie falcon, upland sandpiper, burrowing owl, mountain bluebird, clay-colored sparrow, Brewer's sparrow, field sparrow, black-tailed prairie dog, and snapping turtle. One small prairie dog town existed in the EMU, but control measures were applied this past summer. Three prairie falcon nests have been located two to three miles south of the EMU.

I. CULTURAL RESOURCES

Within the Ashland (Decker-Birney) tract, 748 acres of surface over federal coal have been intensively inventoried in one survey contracted by BLM (Bryant, Rollefson and Gehr 1980). (See Map 2.) The survey recorded 10 prehistoric sites including six lithic scatters, three stone cairn sites with associated lithic scatters, one stone raw material source with associated lithic scatter, and 50 isolated artifacts. Two of the sites have been recommended eligible for the National Register of Historic Places, in consultation with the Montana State Historic Preservation Officer. One site is of undetermined eligibility. BLM is seeking determinations of eligibility from the Keeper of the National Register.

Present impacts to cultural resources derive principally from rodent disturbance, grazing activity, frost heaving and erosion. Projected site density for the unsurveyed portions of the tract at 95 percent confidence is 8.55 $\pm$ 1.94 sites per square mile. There is a 20 percent probability of locating additional sites eligible for inclusion in the National Register, based on present information.

J. VISUAL RESOURCE MANAGMENT

The tract is located in an area used exclusively for ranching and some farming. The only current intrusions are those activities associated with the ranching and farming operations. Because of the rural nature, scenic quality is fairly good with low mountains, forested hills and some breaks in the area. The area contains scenic quality categorized as class B because of its uniqueness in land form, color and vegetation.

K. ECONOMICS

Present employment in the affected areas of Colstrip and Forsyth in Rosebud County and Broadus in Powder River County is approximately 1,883 energy workers. New workers, including both construction and operational employees at Western Energy Co., Peabody Coal and MONTCO mines, the increased railroad activity and Colstrip 3 and 4 power plants will increase 1983 energy-related employment by 2,152 workers. About 679 jobs in secondary sectors in Rosebud County would form during the same time period largely as a response to the new primary jobs.

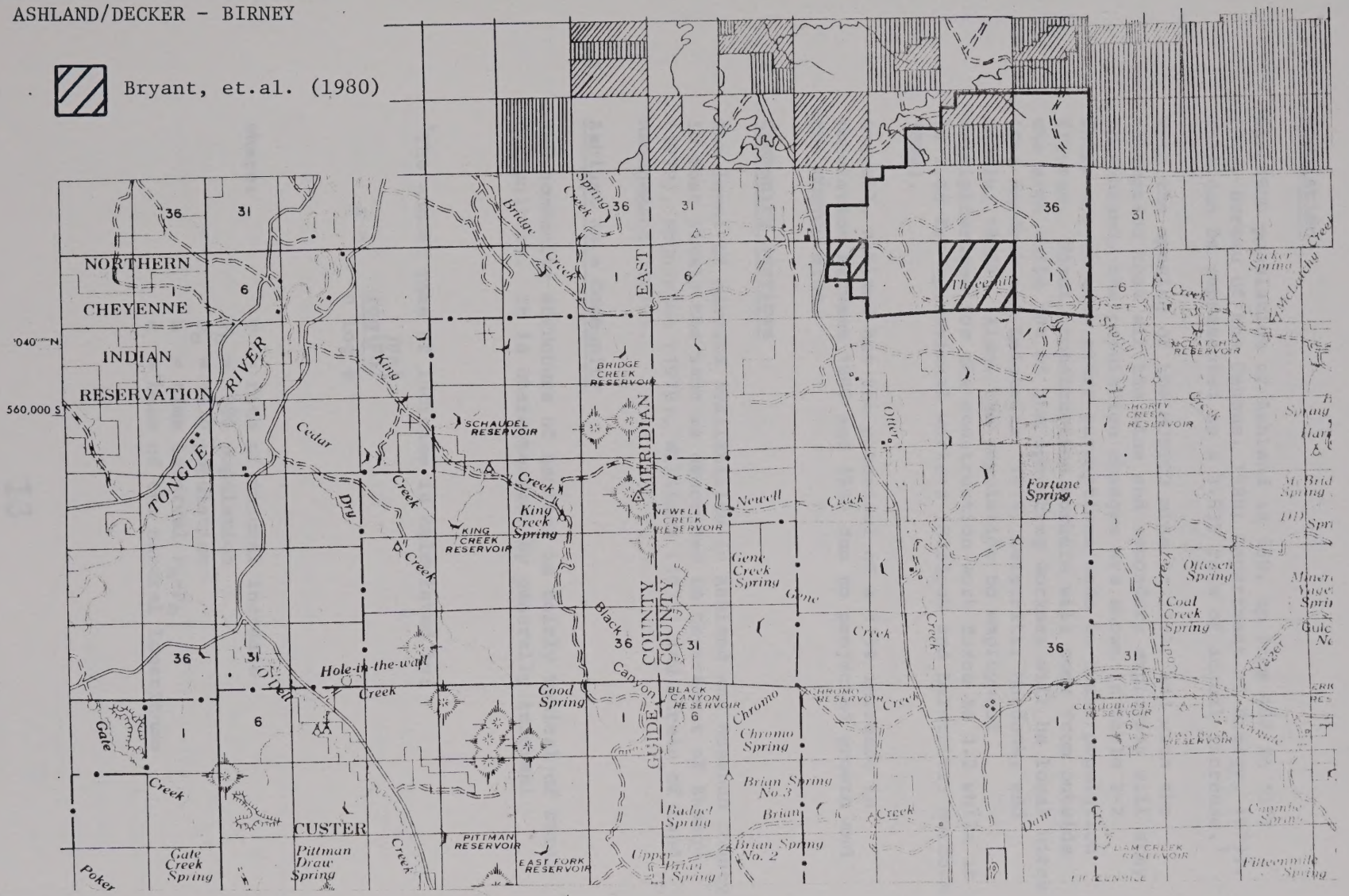
By 1987 energy-related employment drops in Rosebud County by 2,027 workers, due to the withdrawal of construction work forces from Colstrip 3 and 4 and the MONTCO mine, partially offset by small gains in mining and power plant operating work forces. This decrease in primary employment would lead to a drop in total employment in Rosebud County of 1,360 jobs. (Some growth in secondary employment between 1983 and 1987 would occur due to long term changes in the composition of the economy.)

MAP 2

CULTURAL SURVEY CONDUCTED ON TRACT

CULTURAL RESOURCE INVENTORY
ASHLAND/DECKER - BIRNEY

Bryant, et.al. (1980)



L. SOCIOLOGY

1. Population

The 1980 population of Ashland is 569, up from 400 in 1970 (U.S. Bureau of the Census, 1980; Department of Energy, 1979). This can be represented as a 3.53% rate of annual increase.[1]

With the opening of the MONTCO mine in 1982, and with the assumption that all the mine and secondary employees will stay in Ashland, the population changes are shown in Table 3-2. There are several other assumptions made in these population figures. First, construction workers will come from outside the area while 50% of the operating workers will be local hires (See Murdock and Leistritz, 1979; Leistritz, Murdock, and Leholm, 1980). Also, the population to employment multiplierused for the construction work force is 1.2 while it is 1.65 for operational workers (Murdock and Leistritz; Murdock 1980).

Overall, Ashland has the potential of a 115% increase in population between 1980 and 1990 due to projected growth and the MONTCO mine.

2. Community Services

The level of service availability in Ashland and Rosebud County is most likely the same as described in Department of Energy (1979), McQuiston (1979), Williams (1975) and Bureau of Land Management (1979).

3. Ashland as a Community

The community structure of Ashland is fairly typical of rural communities. It is characterized by generally informal

[1]The annual rate of increase is calculated by:

$$r = \frac{\log\left(\frac{Pn}{Po}\right)}{n \log e}$$

where:
- r = rate of natural increase
- P_n = 1980 population
- P_o = 1970 population
- n = time interval P_n-P_o
- e = base of the natural logarithms

TABLE 3-2

Population of Ashland From Projected Growth and the MONTCO Mine, 1980-1990

Year	Additional Population from Projected Growth[a]	Additional Population Due to MONTCO Mine	Total Population
1980			569
1981	20		589
1982	21	47	657
1983	21	527	1,205
1984	23	-46	1,182
1985	23	-395	810
1986	24	No Change	834
1987	24	25	883
1988	26	162[b]	1,071
1989	27	99	1,197
1990	27	No Change	1,224

[a] calculated using the geometric growth curve

$$P_n = (1+r)^n$$

where:

P_n = future population
P_o = base population
r = rate of natural increase
n = time interval, in years

[b] includes 83 secondary jobs with a population to employment multiplier 1.65

relations, little bureaucratization of social life, and a well established system of roles and statuses in the community (Hillery, 1968; Cortese, 1980).

Ashland can also be seen as an independent community. That is, a community that is small in population, isolated, has a simple technology, and has a marked stability (Hawley, 1950). This type of community structure has led to a great emphasis on local self-sufficiency and a distrust of governmental and other agencies outside the area (Murdock and Leistritz, 1979).

BLM Library
Denver Federal Center
Bldg. 85, OC-521
P.O. Box 25047
Denver, CO 80225

BLM Library
Denver Federal Center
Bldg. 50, OC-521
P.O. Box 25047
Denver, CO 80225

4. Attitudes

Overall, most residents in the Powder River area favor coal development (BLM 1980). This favorability, however, is not unconditioned; if it is felt that the nation does not need the coal to ease the national energy problems or that reclamation is not possible or not planned, favorability towards coal development would be greatly reduced.

Also associated with attitudes towards coal development are desires to see some controls on development. The controls are of two types: environmental and governmental. Environmental controls are centered around reclamation and concern for water supply and quality. The governmental controls are unspecified, but a strong feeling exists that some level or levels of government should exercise some controlling authority over development. Stated in another way, it is felt that mining companies should not have a free hand in the development of coal.

With respect to whether people were more concerned with environmental or social impacts, the responses were evenly split.

M. AIR QUALITY AND NOISE

Noises and odors are of a natural origin except for some influence from vehicles and farm machinery.

CHAPTER III ENVIRONMENTAL CONSEQUENCES

This section describes the significant environmental effects that would occur with implementaton of the proposed action including the alternatives. Such items as threatened and endangered plant and animal species, floodplains and wetlands, and wilderness values have been considered and are discussed as appropriate. Also, negative declarations included in the matrices are not presented within the impact descriptions in this section. Principal basis for the analysis is the professional judgments of the resource specialists, public and other agency input, and related works, as referenced.

I. NO ACTION ALTERNATIVE

The no action alternative would result in no disruption of the natural land surface.

Under the no action alternative, about 378 million tons of coal would not be recovered. Three levels of government participate in mining through their taxing power. The federal government's royalty of (at least) 12.5% of the mine-mouth sales price of the coal would, at $10 per ton and 2,723,000 tons of federal coal per year yield an annual tax harvest of about $3,404,000, half of which ($1,702,000) would be rebated to the state. The State of Montana severance tax of 30% is applied not to the sales price but to the sales price less some production-based taxes -- the Contract Sales Price (CSP). The CSP is a function of a complex formula, however, generally the severance tax is about 22% of the mine-mouth sales price. The Ashland (Decker-Birney) EMU, producing 9.12 million tons per year at $10 per ton, would generate about $20,064,000 of annual severance taxes. County and school assessed value equals 45% of the contract sales price or, at $10 per ton mine-mouth sales price, $3.33 per ton. Powder River County 1977 mill levies, including schools, averaged 81.73 mills. The Ashland (Decker-Birney) EMU, producing 9.12 million tons, would at that rate generate about $2,482,000 in gross proceeds taxes for the county and schools (27.2¢ per ton - $3.33 x .08173).

Under the no action alternative, the paleontological resorce would remain undisturbed. However, the potential for exposure and study of unearthed fossils would be lost.

If mining does not occur, none of the impacts related to this tract will be experienced.

II. PROPOSED ACTION

A. TOPOGRAPHY

The natural variety of landforms now displayed within the area would be reduced by mining. Slopes, out of necessity to abate erosion, would be reduced. Changing or altering the natural erosional patterns will increase the rates of the area's sediment yield until such time that natural vegetation can be reestablished.

B. GEOLOGY

The major impact of the proposed action would be the removal of about 378 million tons of coal.

C. PALEONTOLOGY

Fossils may be destroyed during the mining process. However, surface disturbance may unearth fossils that could be collected and studies made of specimens that would have otherwise remained buried.

D. SOILS AND RECLAIMABILITY

The proposed action would have a significant impact on the soil in the tract (see Table 3-1). By the end of mine life, 5,528 surface acres would be disturbed, including 160 acres used for facilities. There are 50 acres are used for haul roads, which are within the EMU and run through the facilities site.

Soil impacts include: displacement of soil from wind and water erosion, change in soil structure and natural fertility, soil compaction from haul roads, and significant problems in revegetation and stabilization.

In the tract, there is a low potential displacement of soil by wind erosion of 51 percent and a moderate potential displacement of soil by water erosion of 53 percent (see Table 3-1).

Disturbances of the soil would result in alterations of soil structure and porosity. This alteration would affect permeability, infiltration rates, soil-air and soil-water relationships and bulk density. The natural fertility would be affected by disruption of the nutrient cycle and a decrease in organic matter content within the soil. Salinity content would increase as a result of the lower calcareous horizons being brought to the surface.

The soil reconstruction potential is derived from the National Soils Handbook (USDA). The soil hazard conditions determine the reconstruction potential. The tract is rated as four percent good, 11 percent fair and 85 percent poor for reconstruction. Suitability of the soil material for plant growth is rated as one percent good, 14 percent fair, 17 percent poor and 68 percent unsuitable (see Table

3-1). The soils rated poor can be reclaimed, but would require more intensive and costly management to be revegetated and stabilized.

E. WATER RESOURCES

1. Ground Water

The primary effect of mining on ground water is on well water in and near the tract during mining and on long-term water quality. Water levels in about nine wells in the vicinity of the tract would be very much reduced and could go dry during mining. Flow into the pit during mining would be low among the tracts, preliminarily estimated at 900 cu ft/day with an adequate stream buffer (Cannon 1980). Four stock wells would need to be redrilled to about the premine depth.

Following mining, water quality at the depth of the Knobloch coal seam and alluvium in the vicinity of the mine would be degraded by increased salinity. The impact would be long-term but the degree is unknown. However, the water would be usable for stock but would be even more marginal than the poor quality water currently used for household purposes.

2. Surface Water

Stream flow in Otter Creek would be only slightly reduced during mining if an adequate stream buffer is provided (Cannon 1980). Sediment yields can be considered to be proportional to the soil erosion losses discussed in the soils section. For the tract, the primary effect on surface water is related to increases in ground water chemical concentration following mining. However, ground water from the mined area would be diluted by upstream flow when used for waterspreading or fish spawning, so downstream effects would be slight.

3. Alluvial Valley Floors and Flood Plains

Plants drawing from subsurface water (subirrigation) in the alluvium would be slightly influenced by increased ground water chemical concentrations following mining. The effect would be greatest in the subirrigated land adjacent to the tract; downstream land would not be affected as much because less concentrated water from outside the tract would dilute increases in concentrations from mining the tract. Crops that are more sensitive to salts would be affected more than less sensitive ones. For example, alfalfa is more sensitive than barley. Mining of this EMU would have less influence than either of the Otter Creek tracts, since it borders less of the alluvium.

F. VEGETATION

If the range is in excellent condition (100-76%) there would be an approximate loss of 1,617 to 1,189 AUMs. However, in its present condition, there would be a loss of approximately 1,019 AUMs.

Reestablishment of native vegetative communities depend upon climatic conditions, species diversity and reclamation technique.

The reclamation process for the initial cut would probably be delayed for 2-3 years dependent upon the mining operation. When the mining operation gets into a cut-and-fill situation then the reclamation process would start. Provided there is adequate vegetation present on the reclaimed land, grazing would start after the sixth or seventh year on the initial 138-acre cut and approximately in the fifth year after the mining process becomes a cut-and-fill operation. As mining proceeds in different areas of the tract, not all of the land is utilized for mining at any one time and grazing could occur on portions of the tract.

Mining of the area would temporarily eliminate opportunities for domestic livestock to occupy the surface and to utilize the forage. However, vegetative production may be better after mining (due to extensive reclamation work) and the area may produce more than the current number of AUMs per acre. There is, however, no evidence that the plant community that ultimately evolved would support higher levels of livestock grazing than the premining vegetation supported.

Additional impacts resulting from vegetation disturbances would be (a) possible reduction of the visual aesthetics, (b) increased soil erosion, and (c) reduction in the amount of wildlife and livestock forage.

The Office of Surface Mining assures that the mining company establishes a diverse, effective and permanent vegetative cover to standards set by the Montana Department of State Lands and the federal Bureau of Land Management.

G. LAND RESOURCES

1. Agriculture

The proposed action would have a significant impact on agriculture in the tract (see Table 3-3). By the end of mine life, 5,528 acres would be disturbed in addition to 210 surface acres used for facilities and haul roads.

Impacts on agriculture include displacement of 463 acres (195 acres subirrigated and 268 acres non-irrigated) of class II,

TABLE 3-9

Ashland (Decker-Birney) Coal Tract

Surface Ownership	Percent of Area	Acres	Land Capability Class 1/ Non-Irrigated	Land Capability Class 1/ Irrigated	Use of land	2/ Predicted Average Yields (Acres X Ave. Yield/Acre) = 2/ Wheat Dry-land (Bu)	Wheat Irrigated (Bu)	Barley Dry-land (Bu)	Barley Irrigated (Bu)	Oats Dry-land (Bu)	Oats Irrigated (Bu)	Alfalfa Dry-land (Ton)	Alfalfa Irrigated (Ton)	Tame Hay Dry-land (Ton)	Tame Hay	Pasture Dry-land (AUM)	Pasture Irrigated (AUM)
Private	4.31	238	III	—	Cropland	4123	—	5817	—	560	—	340.2	—	217.0	—	294.0	—
Private	2.82	156	III	II	Cropland	3844	8114	6178	10265	7364	12353	169.0	791.0	127.0	—	140.4	1863
Private	0.71	39	III	III	Cropland	815	1921	1335	2462	800	3104	37.5	175.5	28.4	—	33.9	364
Private	0.54	30	IV	—	Cropland	572	—	868	—	1170	—	22.8	—	19.6	—	26.8	—
Total	8.38	463			Cropland	9354	10035	14198	12727	9894	15457	569.5	966.5	392.0	—	495.1	2227
Private	2.13	118	III	—	Not Presently Cropped	2118	—	3808	—	750	—	118.8	—	70.3	—	109.8	—
Private	0.62	34	III	II	Not Presently Cropped	812	1768	1310	2285	1740	2712	37.0	170.0	27.6	—	30.6	408
Private	1.18	65	III	III	Not Presently Cropped	1405	3051	2247	4086	600	3000	58.5	279.5	53.4	—	58.5	660
Private	2.62	145	IV	—	Not Presently Cropped	2457	—	3638	—	3420	—	111.3	—	98.6	—	140.3	—
Total	6.55	362			Not Presently Cropped	6792	4819	11005	6371	6510	7712	325.6	449.5	249.9	—	339.2	1068
State of Montana	0.29	16	III	—	Not Presently Cropped	288	—	544	—	—	—	14.4	—	9.6	—	14.4	—
U.S. Government	0.04	2	IV	—	Not Presently Cropped	26	—	44	—	—	—	1.0	—	2.0	—	3.0	—

1/ Soil Capability classification is derived from the published Powder River County Soil Survey Report issued June 1971

2/ Cropland, hayland suitable for cropland and average predicted crop yield derived from the published Powder River Soil Survey Report, issued June 1971 and data from Agricultural Stabilization and Conservation Service, Powder River County.

III and IV privately-owned land that would produce, on the average, 1,158 tons of alfalfa and 463 AUMs or 14,730 bushels of wheat per year.

a. Economic Impacts on Agricultural Sales Activity

Assuming, for analytical purposes, a ranch output figure of $164 (LLS = lost livestock sales) per cow/calf unit and using 10.75 AUMs or 0.7 tons of hay as the forage requirement of, respectively, a fully allocated cow/calf pair[1/] or fully allocated cow/heifer with calf in utero[1/], we have (assuming a five-year disturbance cycle):

$$LLS = \$164 \left(\frac{.125 \text{ minewide AUMs}^{2/}}{10.75} + \frac{.125 \text{ minewide tons of hay}^{2/}}{.7} \right)$$

Based on the formula above, the loss of ranch output (LLS) due to mining of Ashland (Decker-Birney) would be about $36,700 per year (at peak disturbance. The loss of secondary income dependent on ranch output (wages and profits in business/government(s) which supply or depend on agriculture would be $9,200 per year.

b. Off-site Impacts

Loss of haylands near Ashland due to urbanization would (irrevocably) eliminate about $74,000 of agricultural output (LLS) and $18,500 of secondary income.

c. Total Impacts

Total annual agricultural output loss of $110,700 place this EMU third in order of agricultural impacts.

d. Rancher Perspectives on Economic and Social Impacts

All of the five landowners in the Ashland (Decker-Birney) EMU were contacted. The largest landowner has less than 1% of the land in the EMU (only 0.16% of his total operation is within the EMU). The smallest has 12% of the EMU acreage, however, 36% of this smallest operation is in the EMU. Two of the landowners had 36% each of the EMU acreage. None of the landowners felt he would suffer a net economic hardship while four felt that they would benefit economically with mining. While the majority of the operators felt they might benefit economically, two of the landowners felt they would suffer a lowering of their level of quality of life with one of the ranchers being

1/ A fully allocated cow/calf pair (ccp) or cow/heifer with calf in utero (ccu) includes the amount of forage needed to sustain the ccp/ccu plus the pro rata share of the forage needs of replacement heifers, herd bulls and horses (if any) and is, therefore, the sum of both direct and indirect forage needs.

2/ Using a 5-year disturbance period over the 40-year mine life, .125 of the forage would be lost at peak disturbance.

opposed to development. Four ranchers were undecided as to whether or not they were in favor of development of coal mining.

2. Recreation

No significant long-term impacts are expected to occur on the tract. Some secondary impacts would occur. Overall recreational demand on federal and private lands would increase due to population increases and the construction or relocation of roads at the mine site might improve legal and/or physical access to some areas. These increases would probably reduce levels of recreation enjoyment due to increased crowding, litter and pollution at and near developed recreation sites.

3. Other Land Uses

Impacts on land use would be relatively minor but highly concentrated. Industrial activities would be introduced into an area of no previous actvity and with no ability to support mining without construction of major facilities and improvement of existing transportation routes. The existing ranching, farming and wildlife uses of the tract would be displaced for the life of the mine but would again be possible after reclamation. The mine will disturb 6,240 acres plus additional offsite acreages for roads, railroads, and utilities. Assuming respective rights-of-way widths of 100, 200, and 60 feet, the additional disturbed area would total 361 acres for a five-mile rail spur from the proposed Tongue River Railroad, and a minimum 33-mile powerline route from Colstrip.

Changes in the land from these mine-related uses would be mostly temporary and insignificant after reclamation.

The existing road system would have to be extensively upgraded with roads to and within the site. Problems associated with this include increased trespass, vandalism, litter, and fire hazard potentials. The railroad spur may eventually encourage additional industrial development of the area. Increased road and rail traffic also increases the potential for more accidents because of greater exposure. The impacts would cease at the end of mining if unnecessary transportation corridors are abandoned and reclaimed; however, this type of land use commonly remains longer than the activity it serves.

H. WILDLIFE AND FISHERIES

The impacts upon fisheries and wildlife habitats and populations are summarized in the matrix (Appendix). Impacts are rated for the 40-year life span of the mine. Two sharp-tailed grouse arenas along with the surrounding nesting habitat will be lost in mining. The existence of similar vegetation on adjacent areas would help to

minimize overall population impacts unless other mines were to open in the Otter Creek drainage. Impacts would then be compounded by the increased habitat disturbance.

Mining would disturb hunting territories for the golden eagles and prairie falcons which nest south of the EMU. The extent of the disturbance is not known as actual territories have not been delineated.

Habitat lost to mining would displace up to 24 antelope and 14 mule deer from traditional spring and summer use areas.

Habitat for non-game birds, mammals and reptiles would be lost during mining. No estimate of numbers displaced is known, but it is felt it would be low, based on the availability of similar adjacent habitat.

If surface runoff is controlled and the contributing aquifers to Otter Creek are not significantly disturbed, the quality and quantity of water for fisheries would not be significantly affected. No accurate assessment of impacts on the fishery can be made.

Increased traffic along the Otter Creek road and the influx of people to the area would increase the number of game and non-game birds and animals killed by vehicular accidents and illegal hunting activity. No estimate of this impact can be made at this time.

I. CULTURAL RESOURCES

All sites within the tract boundaries would be subject to direct impact from construction of facilities, transportation corridors, powerline corridors and mining activities, resulting in damage and destruction of sites and their immediate environmental context. Sites not subject to immediate direct impact will receive indirect impacts from increased erosion, increased access and increased vandalism. Cultural resources buried by colluvial and alluvial deposition, and not previously located in surface inventory, would also be destroyed. Should the tract be leased, a mitigation program would be undertaken for all cultural resources in the tract. If avoidance and preservation alternatives are not feasible, a scientific program of data retrieval will be developed and implemented.

J. VISUAL RESOURCE MANAGEMENT

Mining would completely change the character of the tract. Visual impacts would increase in the form of land disturbances due to the mines, roads, railroads, and utilities. Changes to the topography, vegetation and scenic quality would occur. Currently, there are no industrial influences in the area, so the contrast would tend to be extreme. Along with this, some decrease in visibility would occur from dust and vehicle emissions. Overall, adverse impacts would be relatively insignificant both during and after mining because the mine would not be readily visible from any major highway and the topography would not be significantly altered after reclamation. Due

to the location, due to the location, the visual impacts would be experienced only by persons visiting the mine. Generally, the visual impacts would be about the same as those of other mines in the region. All of the impacts would either cease or be reduced to very low levels when mining ends and reclamation is completed.

K. ECONOMICS

1. Employment Change

The Ashland (Decker-Birney) tract would support a mine employing about 335 operations workers. If the mine were open in 1987, employment would peak at 412 workers (some construction and operations workers would be there simultaneously). This would induce the creation of 81 secondary jobs between 1987 and 1990. By 1990 mine employment would fall by 77 workers. The total 1990 (primary and secondary) employment with Ashland (Decker-Birney) would be 416 above what it would have been without the development.

2. Cost of Living Implications* - For Ashland Area Mines Only

Growth in the Ashland area will probably result in significantly higher cost of living with increased housing costs contributing most to overall increased cost of living. While it is not possible to state exactly how many people will be directly affected, a recent study (University of Montana 1979) indicates that about three in every ten eastern Montana households had low or fixed income (less than $10,000 per year-1978 dollars) and 17% of the households are headed by persons of retirement age (65 and over). If housing cost increased by 25%, then units which in 1978 cost from $150 to $199 per month, would increase to from $187 to $248 per month. The University of Montana study found that 49% of those buying their homes in eastern Montana and 79% of those renting paid $199 per month or less and that about 23% of all households felt they could not afford to pay more than $199 per month for shelter. As increases in housing costs of 25% are likely (see Appendix D of the Regional paper "The Economic Setting of Southeast Montana"), it is likely that nearly three of every ten households confronting the higher housing costs will be low or fixed income households, that about one in every six will be a household with a household head of retirement age and that two of every nine households will have difficulty adjusting to the higher housing costs.

3. Fiscal Impacts

Ashland (Decker-Birney) would, along with Ashland (Coalwood) and Southwest Otter Creek, have the highest level of fiscal impact. Ashland, unlike Colstrip, is not being provided community capital additions (schools water, sewer, etc.) by a

sponsor.* A prefiled bill, LC 181,+ would, if passed by the Montana Legislature, encourage areas like Ashland & Colstrip to incorporate to receive Coal Board assistance. Ashland, if it incorporates, would be at a relative disadvantage to Colstrip and Spring Creek (new town) as the other communities would already have made much of their capital investment before incorporation.

Development of an Ashland (Decker-Birney) mine would result in all mine-based tax revenues flowing to Powder River County even though much of the population would settle in Rosebud County (Ashland).

L. SOCIOLOGY

1. Population

The population affect of an Ashland (Decker-Birney) mine is shown in Table 3-4. All of the assumptions stated in Chapter II apply here. In addition, it is assumed that 40% of the population increase from an Ashland (Decker-Birney) mine would go to Broadus to live because of the population growth in Ashland.

With an Ashland (Decker-Birney) mine, Ashland's population increase would be 144%, including the MONTCO mine, over the decade of the 80's, while Broadus would increase by approximately 5%.

Because Broadus is very similar to Ashland in terms of community structure, the impacts to Broadus would be similar to those in Ashland, although to a much lesser extent.

These population figures should be seen as heuristic. They are based on many simplifying assumptions. Not only are the figures based on the assumption that growth rates will remain the same, but that the incoming population will actually settle where it is suggested here.

2. Community Services

The community services in Ashland that will likely be the most severely impacted are medical, housing, and recreation (Williams 1975; Murdock, Leistritz, and Schriner 1980). Other services and institutions that will be affected are the schools and the criminal justice system.

Literature: Wallwork, Susan Selig, Maxine C. Johnson and Paul E. Polzin. Housing Needs and Preferences: A Survey of Montana Households. University of Montana, Missoula, Montana. 1979.

*Montana Power has contracted for much of the capital additions in Colstrip.

+State Senator Tom Towe, personal communication, December, 1980. The exact wording of the bill is not yet known but areas like Colstrip and Ashland would be encouraged to incorporate.

TABLE 3-4

Population to Ashland and Broadus
From An Ashland (Decker-Birney) Mine,
And Total Population 1980-1990

Year	Additional Population to Ashland From An Ashland Decker-Birney Mine [a]	Additional Population to Broadus From AN Ashland Decker-Birney Mine [a]	Ashland Total Population [b]	Broadus Total Population [c]
1980			569	715
1981			589	707
1982			657	699
1983			1,205	691
1984			1,182	684
1985			810	676
1986	260	174	1,094	843
1987	25	16	1,168	851
1988	-160	-107	1,196	737
1989	41	28	1,363	758
1990			1,390	750

[a]Includes construction, operational and secondary workers

[b]Includes the projected growth and MONTCO mine population from Table 3-2, Chapter II

[c]Based on geometric growth of Broadus using a rate of annual increase of -.0111

3. Attitudes

The impacts of development on social attitudes cannot be assessed until after development has occured. There is no way to estimate what changes, if any, in attitudes would occur.

4. Changes in Ashland Community Structure

Given the increase in population to Ashland, the community can be expected to change along the following dimensions. First, increase in population from mineral development will result in a more heterogeneous community which, in turn, generates varying degrees of community conflicts (Albrecht 1978, Cortese 1980, Murdock and Leistritz 1979). Secondly, community interaction will tend to become more formal due to the increase in bureaucratization (more aspects of everyday life become handled in and through bureaucracies). Thirdly, the longtime residents may lose some of the sense of community they had before development.

In terms of the policy, more decisions that affect the community will be made by extra-local sources.

Finally, it must be noted that many of these changes, such as extra-local control and increasing bureaucratization, are occurring in rural communities like Ashland without development (Vidich and Bensman 1968, Warner 1974, Warren 1978); the impacts of coal development just hasten these changes.

M. AIR QUALITY AND NOISE

The present noises and odors would dramatically change from natural to industrial origins as heavy mining equipment, rail and road traffic and explosives use are begun or increased from present levels.

III. SHORT-TERM VERSUS LONG-TERM IMPACTS

A. SHORT TERM

Production through life of mine is estimated at 378 million tons of coal. The tract would be temporarily committed to a single use that would in turn impact other potential uses.

Short-term impacts on wildlife from mining of the four Ashland-Otter Creek tracts are summarized. Up to ten sharp-tailed grouse arenas and the surrounding nesting habitat would be lost. Approximately 64 mule deer and 184 antelope would be displaced from wintering areas during mining. Nesting golden eagles and prairie falcons would be disturbed by mining and an unknown quantity of hunting territories would be disturbed by mining. Habitat for non-game birds, mammals and reptiles would also be lost in the short term. An undetermined number of birds and animals would be killed by vehicular accidents and illegal hunting activity due to the increased human population during the life of the mines. Impact on the Otter Creek fishery would be dependent upon the maintenance of water quality and quantity.

B. LONG TERM

Evidence of mining and reclamation would remain in the form of less contrasting topography and an alteration of soil texture and porosity.

Long-term imapcts on wildlife would be dependent on the success of reclamation. If shrubs and ponderosa pine cover cannot be restored, the vegetative diversity of the area would be decreased. This decrease in the vegetative diversity would also decrease the variety of birds and animals currently found in the tracts.

IV. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCE

The coal removed by mining and that left by current recoverable techniques would be lost from future use.

V. NET ENERGY ANALYSIS

A net energy analysis was calculated using the guidance contained in BLM Washington Office Information Memo 79-282, August 1979. Approximately 38 British thermal units (BTUs) would be expended to produce a pound of coal. That pound of coal, in turn, would produce about 8,462 BTUs. The ratio of energy produced to that expended is over 225 BTUs/1 BTU.

The net energy relationship (ratio of energy produced to energy consumed) for the Ashland Decker Birney EMU is 326 to 1.[1]

1 Based on the Btu value per pound of coal as given in the tract delineation reports and on an average input energy value of 25.6 Btu's of energy consumed for each pound of coal produced (average of the energy consumption of the Decker mines as described by USGS in a 1977 EIS and the WECO area B expansion as described by the Montana Department of State Lands in a 1978 EIS). Only direct energy consumption was considered (the ratios shown do not contain any estimate of energy used in transporting the coal from the mine to the demand center).

ELEMENT	PRESENT SITUATION	ANTICIPATED EFFECT OF LEASING/DEVELOPMENT	SIGNIFICANCE OF ANTICIPATED IMPACT	DATA RELIABILITY	COMMENTS
Soils	There are 29 soil series in the tract mapped at level two in a survey done by the Soil Conservation Service, which are found along ridges, divides, footslopes and terraces.	There will be displacement of soil by water and wind erosional forces; change in soil structure and natural fertility and significant problems in revegetation and stabilization on steep slopes.	Significance of the impact will be high. Reconstruction potential is rated as 85% poor and suitability of soil material for reclamability is rated as 17% poor and 68% unsuitable	Data reliability is 30% from the Powder River County Area Soil Survey. Better soils in the bottomlands are more accurately mapped than those on the rangelands and steep-sided slopes.	The overall view of the Tract for reconstruction potential is lower than what it actually is because of the low reliability of the Powder River County Area Soil Survey.
Water Resources Ground Water Use in Tract	4 stock wells are in use in the Tract.	Wells would need to be redrilled, if needed, after mining.	Minimal cost for mining company to redrill well	Good	
Quantity	Knoblock coal is saturated The natural flow is estimated at ___ cu ft/day.	Water will flow into the mine pit at the given rate. About 9 wells would be affected during mining outside the Tract.	Significant during mining.	Fair-good	
Quality	TDS averages about 2,500 mg/L for Knoblock coal water.	Increase in salinity of wells in the vicinity of mine in and above Knoblock coal seam will occur. Water would still be useable for stock but would be even more marginal for households.	Significant and long term.	Good	Reliability would be better if could better predict ground water concentrations following mining.
Surface Water Quantity	Home A is small and intermittent. Otter Cr. is a small perennial stream with a mean annual flow at Ashland of 6,220 ac ft. 4,200 ac of this drainage is irrigated.	Only very slight reduction of flow during mining with adequate stream buffer on the other side of clinker adjacent to creek. Possibly slight effect after mining.	Minor if buffer used.	Fair-good	

ELEMENT	PRESENT SITUATION	ANTICIPATED EFFECT OF LEASING/DEVELOPMENT	SIGNIFICANCE OF ANTICIPATED IMPACT	DATA RELIABILITY	COMMENTS
Quality	Average TDS for Otter Cr. is about 2,000 mg/L. High salinity and medium sodium irrigation hazard occurs except during high flows, 0.0-1.2 ac ft/sq mi/yr of sediment yield.	Increases in baseflow TDS of Otter Creek after mining. Water would still be useable for stock and high flow water spreaders.	Very slight but long term.	Fair	
Alluvial Valley Floors and Flood Plains	Otter Creek has a possible AVF and floodplain in and adjacent to the Tract.	Following mining, degradation of ground water quality would occur in adjacent alluvium. Small reduction in more salt sensitive crop productivity.	Slight but long term.	Same as above	
Agriculture	There are 463 acres of Class II, III and IV land in the tract that is presently being cropped. This land is found in the bottomlands.	There will be displacement of lands currently being cropped and suitable for cropland.	It will reduce the alfalfa hay production by 1158 tons and 463 AUMs per year for at least a 5 year period. There will be 156 acres mined per year. The agriculture land disturbance will be dependent on sequence of mining operations.	Data reliability is 30% from the Powder River County Soil Survey, Soil Series, Descriptions and Interpretations prepared by the Soil Conservation Service. Better soils in the bottomlands are more accurately mapped. Soils tend to be better than indicated in the soil survey by Powder River County SCS.	

ELEMENT	PRESENT SITUATION	ANTICIPATED EFFECT OF LEASING/DEVELOPMENT	SIGNIFICANCE OF ANTICIPATED IMPACT	DATA RELIABILITY	COMMENTS
Vegetation					
Rangeland types	EMU Acres	Acres Being Disturbed			
Ponderosa Pine			High - - - -	Good	
Savannah	Sagebrush-grassland 3695	Sagebrush-grassland 3695 High	Long term elimination		
Undifferentiated	Ponderosa pine 1370	Ponderosa pine 1370 High	of the natural vegeta-		
Streambottoms	Other 463	Other 463 Low	tion mosaic and species		Reclamation of Ponderosa
	5528	5528	diversity		pine not yet proven.
Animal Unit Months (SVIM)	1019 AUMs	High	Loss of 1019 AUMs High	Good	
Animal Unit Months If Range is in Excellent condition 100-76%				Good	100% 76% 1617 AUMs - 1189 AUMs
Threatened Endangered or Noxious species	There are no threatened or endangered plant species found growing in the EMU. However, there are six noxious species found growing in the Powder River Resource Area, but it has not been determined if these species are found growing in the EMU. The species are: A. Convolulus aruensis B. Cirsium arvense C. Euphorbia esula D. Centaurea ropens E. Cardaria draba F. Centaurea maculosa	Low	Low	Good May 16, 1980 Regional Director Region 6 U.S. FWS Denver, Colorado	

ELEMENT	PRESENT SITUATION		ANTICIPATED EFFECT OF LEASING/DEVELOPMENT		SIGNIFICANCE OF ANTICIPATED IMPACT	DATA RELIABILITY	COMMENTS
Reclamation-Vegetation	On Federal, State and Private lands, the Office of Surface Mining (OSM) assures that the mining company establishes a diverse, effective and permanent vegetative cover to standards set by the Department of State Lands of Montana and the Federal Bureau of Land Management.		Low		High-failure of Reclamation Low-success of Reclamation	Good	
Wildlife Habitat	Acres	% of Total	Acres Disturbed	Year 2026			
Sagebrush-grassland	4158	75	4158	Moderate negative	Low negative	Good	Reclamation of Ponderosa
Ponderosa pine	1370	25	1370	High negative	High negative	Good	Pine not yet proven.
Population	Level of Use						
Sharp-tailed grouse	High		Moderate negative		Low negative	Good	
Mule Deer	Average		Low negative		Low negative	Good	
Antelope	Low		Low negative		Low negative	Good	
Golden Eagle	Average		Low negative		Low negative	Good	
Prairie Falcon	Low		Low negative		Low negative	Good	
Other Raptors	Average		Low negative		Low negative	Good	
Non-game birds and mammals	Average		Low negative		Low negative	Good	
State species of special interest or concern	Low		Low negative		Low negative	Good	
Reptiles and Amphib	Average		Low negative		Low negative	Good	
Threatened or Endan	None Occur		-----		-----		
Fisheries-Otter Cr.							
Spawning	High		Not assessable		Moderate negative	Good	Impacts dependent on maintenance of water quality and quantity.
Stream fishery	Average		Not assessable		Low negative	Good	

ASHLAND (DECKER BIRNEY)

ELEMENT	PRESENT SITUATION	ANTICIPATED EFFECT OF LEASING/DEVELOPMENT	SIGNIFICANCE OF ANTICIPATED IMPACT	DATA RELIABILITY	COMMENTS
Cultural/Historical Values	96% of surface over Federal coal inventoried; 16 prehistoric sites, 1 historic site, 33 isolated artifacts recorded. 9 sites eligible for inclusion in the National Register; 2 sites of undetermined eligibility. 53% probability of locating additional National Register eligible sites.	Direct impact to all sites within tract boundaries. 10% probability of locating additional sites on ridgetops 30% probability of locating additional sites on benches, 20% prabability of locating additional sites on terraces and valley floors, 20% probability of locating additional sites on slopes.	Destruction of sites, their immediate environmental context, and their scientific and historical information. Reduction of the present finite, non-renewable resource base.	Good	
Recreation	No development or known use of the area. Very limited use may occur. Hunting by permission of landowner. No public access exists.	None. No recreation functions are planned for the area and legal access does not exist.	Virtually none on the short term. No effect on a long-term basis.	Poor	Recreation data is virtually non-existent.
Wilderness	No wilderness potential within or near area.	None	None	Excellent	Wilderness inventory complete and area eliminated from consideration
VRM	Open air, agricultural environment. Area visible from Otter Creek road. Low mountains, forested hills, some breaks. Scenic quality class B.	Disturbance of landforms and natural scene. Some activities visible from Otter Creek road.	Moderate during mine life. Low after reclamation.	High	Very difficult to mitigate impacts while mining is occurring.
Noise Air Quality	Natural sounds are prevalent. Some noise from vehicles and farm machinery.	Severe intrusions of heavy equipment. Construction and use of rail system. Use of explosives. Increased traffic on Otter Creek road.	Quite severe during mining. Impact would cease when mine is closed.	Excellent	Impossible to mitigate during mine life.

ELEMENT	PRESENT SITUATION	ANTICIPATED EFFECT OF LEASING/DEVELOPMENT	SIGNIFICANCE OF ANTICIPATED IMPACT	DATA RELIABILITY	COMMENTS
Transportation Employee:	Existing access by gravel or dirt roads. Low use and maintenance.	Increased traffic on U.S.212, Otter Creek and Tongue River roads. Potential for more accidents. Improvements to roads.	Moderate on all accounts during mining. Very low after mines close.	Good	Road improvements should contribute to safety after mining traffic ceases.
Product:	Roads inadequate for transport. No rail system near area.	Improvements to roads Construction of roads Construction of railroad Rail traffic introduced to area Increased hazards Increased surface disturbance	Moderate Moderate Possibly high Possibly high Moderate Low	Good for all items	
Land Use	No industrial activity. Some farming. Ranching is primary use.	Introduction of industrial activities. Land required for mines, roads, railroads, powerlines.	Moderate during mining. Low to none after reclamation.	Good	Existence of power and rail lines may encourage further development of area.

References

U.S. Department of Agriculture, Soil Conservation Service. "Soil Series Descriptions and Interpretations."

U.S. Department of Agriculture, Soil Conservation Service, Soil Survey Staff. "National Soils Handbook."

U.S. Department of Agriculture, Soil Conservation Service. "Soil Survey - Powder River County Area, Montana." 1971.

U.S. Department of the Interior, Geological Survey and Montana Department of State Lands. "Draft Environmental Statement Regional Analysis, Northern Powder River Basin Coal, Montana." 1979.

References

EMRIA. Otter Creek Study Site, Otter Creek Coal field, Montana. USDI-BLM, EMRIA Report #1, 1975.

Knapton, J.R. and McKinley, P.W. Water Quality of Selected Streams in the Coal Area of Southeastern Montana. USGS Water Resources Investigations 77-80, Helena, MT. 1977.

USGS. Water Resources Data for Montana. USGS Water - Data Report MT-78-1, Helena, MT. 1979.

Consultation

Cannon, Mike. USGS-WRD, Helena. Otter Creek Area Ground Water. (Phone conversation.) H.H. Davis, Hydrologist, Miles City District Offie December 1980.

References

Bryant, R., Gehr, E., and Rollefson, G. Analysis of Methodological Goals, Site and Isolated Artifact Summary Tables, Otter and Hanging Woman Creeks, Class III Cultural Resource Inventory.
Eugene, Oregon: Professional Analysts (Prepared for the Bureau of Land Management, Contract no. YA-512-CT9-250). 1980.

Davis, Carl M. A Preliminary Archaeological Reconnaissance Survey, Bureau of Land Management Lands, Southeastern Montana
Missoula, Montana: University of Montana (Prepared for the Bureau of Land Management, Contract no. 52500-(T5-1100) 1976.

References

Hickey, W. C. Sr. A Discussion of Grazing Management Systems and Some Pertinent Literature. U.S. Department of Agriculture, Forest Service 1969.

Hunter, H. E., R. L. Ross. Climax Vegetation of Montana. U.S. Department of Agriculture, Soil Conservation Service. 1976.

Payne, G. F. 1973. Vegetative Rangeland Types in Montana: Bozeman, Montana Agricultural Experiment Station, Bulletin 671. 16 p.

U.S. Department of Agriculture, Soil Conservation Service. Technicians Guide Section II-E-3 Range Site Criteria. 1972.

U.S. Department of Agriculture, Soil Conservation Service. Rosebud and parts of Big Horn County, Advanced Material Subject to Review and Approval. March 1977.

U.S. Department of Agriculture, Soil Conservation Service. National Range Handbook. 1976.

U.S. Department of Agriculture, Soil Conservation Service. Technicians Guide IIE. Range Site Criteria. 1972.

U.S. Department of Agriculture, Soil Conservation Service. Climax Vegetation of Montana. 1976.

U.S. Department of Agriculture, Soil Conservation Service. Technicians Guide Section II-E-3 Range Site Criteria. 1973.

U.S. Department of Agriculture, Soil Conservation Service, U.S. Department of Interior, Bureau of Indian Affairs, and Montana Agricultural Experiment Station. Soil Survey of Big Horn County Area, Montana. Issued 1977.

U.S. Department of Agriculture, Forest Service and Soil Conservation Service, U.S. Department of Interior, Bureau of Land Management and Montana Agricultural Experiment Station. Soil Survey of Powder River Area, Montana. Issued 1971.

U.S. Department of Interior, Geological Survey and Montana Department of State Lands. Northern Powder River Basin Coal. Montana. 1979.

U.S. Department of Interior. Bureau of Land Management. Soil Vegetation Inventory Methods. 1979.

U.S. Department of Interior, Bureau of Land Management Forage Requirements Range Workshop. Albuquerque, New Mexico. 3/13/80.

Wildlife Management Institute. If Deer Are to Survive. Stackpole Books, Harrisburg, PA 1971.

Consultation

Coenenberg, J. Vegetation Specialist, Western Energy Company. Colstrip, Montana. 1980.

Hemmer, D. Montana Department of State Lands. 1980.

References

Martin, Peter R. "Terrestrial Wildlife Habitat Inventory in Southeastern Montana." USDI/BLM and Montana Department of Fish, Wildlife and Parks. November 1980.

Montana Department of Fish, Wildlife and Parks. Big Game Survey and Inventory (Deer and Antelope) and Upland Gamebird Inventory (Region 7). Helena, MT June 1980.

U.S. Department of Interior, Bureau of Land Management. Powder River Resource Area, Management Framework Plan Amendments. Miles City, Montana. June 1980.

BLM Library
Denver Federal Center
Bldg. 85, OC-521
P.O. Box 25047
Denver, CO 80225